2010

ATTACHMENT 1

TOWN OF BLUFFTON

Division of Growth Management

Office of Planning and Environmental Sustainability

DRAFT MAY RIVER WATERSHED ACTION PLAN TABLE OF CONTENTS

The understanding and approach toward planning in the May River is both complex and challenging, but should proceed with an eye toward a cohesive and coordinated framework for implementation. An Action Plan for the May River Watershed includes a number of specific elements that must be implemented with respect to three time horizons: the now term, the short-term and the long-term. This watershed action plan provides a framework for implementing the many suggestions, statements, goals, objectives and visions of the people that call the May River Watershed home.

1. Preface & Goals

The Town of Bluffton is a coastal community that has historically had strong ties to its local waterbody, the May River. The river is significant to the community for a number of reasons, including:

- its aesthetics and views which increase the popularity of the area for continued residential and commercial growth;
- its numerous natural resource populations that are directly harvested and utilized by local and regional residents; and
- its economic impacts, both direct and indirect, to the community.

Additionally, the water quality within the May River historically has been reported as very good, resulting in the Outstanding Resource Waters (ORW) designation from the SC Department of Health & Environmental Control – Environmental Quality Control's (SCDHEC-EQC) Bureau of Water. All of these facets of the river help provide a sense of community character and pride that is locally and regionally recognized.

Until recently, few sources of possible impairments to water quality existed within the May River Watershed, and even fewer within close proximity to the river itself. However, the Town of Bluffton has grown rapidly in recent years and this trend is expected to continue into the future. Changes in the intensity and types of land use associated with burgeoning population growth and development within the watershed over the past decade have introduced new and greater concentrations of fecal contamination to the system, resulting in undesirable changes in water quality. For the first time in its history, the May River has experienced a shellfish harvesting classification down-grade due to an increased level of fecal coliform in its headwaters.

Rising fecal coliform levels in the May River are a clear indicator of deterioration of the health of a watershed. The Town of Bluffton

and Beaufort County have agreed to work together along with the citizens to take action and develop a plan to improve conditions on the May River prior to further deterioration. Staff has been directed to develop a plan that addresses water quality issues throughout the watershed and to consider a phased approach to protecting all of the outstanding natural resources as outlined in the Comprehensive Plan. Setting out clearly defined and measurable goals, milestones and lead jurisdiction are critical to this plan's successful implementation.

2. Consistency and Alignment of Plans

An integral part of ensuring that the May River Watershed Plan is successfully implemented and maintained is consistency and alignment of plans and guidance documents. Site specific plans, concept plans, Town of Bluffton plans, and Beaufort County plans must be analyzed and adjusted as needed to ensure each plan is consistent in goal of protecting the May River Watershed. Additionally, any plans or guidance documents that are outdated, impractical, or redundant should be eliminated to allow ease in following plans and ease in updating plans to better fit the dynamic May River Watershed.

Deliverables

- Collection of Existing Plans
- Compare and Contrast Analysis of Plans
- Recommendations Report based on Analysis of Plans

Report/Plan/Study	Author	Date	Status
The Blueprint for Clean Water	Clean Water Task Force	1997	Active
Beaufort County Comprehensive Plan	Beaufort County	1997	Active
A Baseline Assessment of Environmental and Biological Conditions in Broad Creek and the Okatee River, Beaufort County, South Carolina	SCDNR, USGS & NOAA	2000	Complete
An Evaluation of Wetland Function and Watershed Significance of Wetland in the Broad and New River Watersheds	SCDHEC-OCRM	2001	Complete
Beaufort County Special Area Management Plan Water Quality Monitoring Initiative	Thomas & Hutton, Co.	2001	
Beaufort County Special Area Management Plan	Cofer-Shabica	2002	Active
Okatie River Watershed Management Plan	Applied Techonology and Management	2002	Complete
May River Water Quality Model	Thomas & Hutton Engineering, Co. and Camp Dresser McKee, Inc.	2002	Complete
A Baseline Assessment of Environmental and Biological Conditions in the May River, Beaufort County, South Carolina	SCDNR, USGS & NOAA	2004	Complete
Beaufort County Stormwater Management Plan	Thomas & Hutton Engineering, Co. and Camp Dresser McKee, Inc.	2006	Active
Southern Beaufort County Regional Plan	Beaufort County	2006	Active
Town of Bluffton Comprehensive Plan	Town of Bluffton	2007	Active
Town of Bluffton May River Monitoring Program: Stormwater Sampling Study	BP Barber	2007	Complete
Waterbody Management Plan for the May River	SCDHEC-OCRM	2008	Active
Town of Bluffton May River Watershed Monitoring Program	BP Barber	2008	Complete
Town of Bluffton May River Watershed Monitoring Program	BP Barber	2009	Complete
Residential Volume Control Cost	Thomas & Hutton Engineering, Co.	2009	Complete
Commercial Volume Control Cost	Ward Edwards, Inc.	2009	Complete
Water Quality Concerns In The May River	SCDNR	2010	Active
Bluffton Significant Tree Assessment and Survey			
Bluffton Critical Resources Assessment and Survey			

3. Watershed Inventory

An inventory and analysis of drainage areas within the May River Watershed is a necessary part of a strong action plan. This section of the plan sets out to clearly define and analyze the sub-drainage basins within the watershed so that findings can be correlated to specific areas. The May River Watershed Drainage Maps and Watershed Analysis will demonstrate the spatial relationship of certain land uses within the watershed so that the catalog of ideas for improvement may be understood from the context of place-based solutions. As a result of the Watershed Analysis, proposed solutions may then be analyzed and understood as an interconnected system as opposed to single basin or project. Policy recommendations such as declaring sensitive areas can be analyzed for effects on the entire watershed, not just for the immediate effects in a particular area.

Deliverables

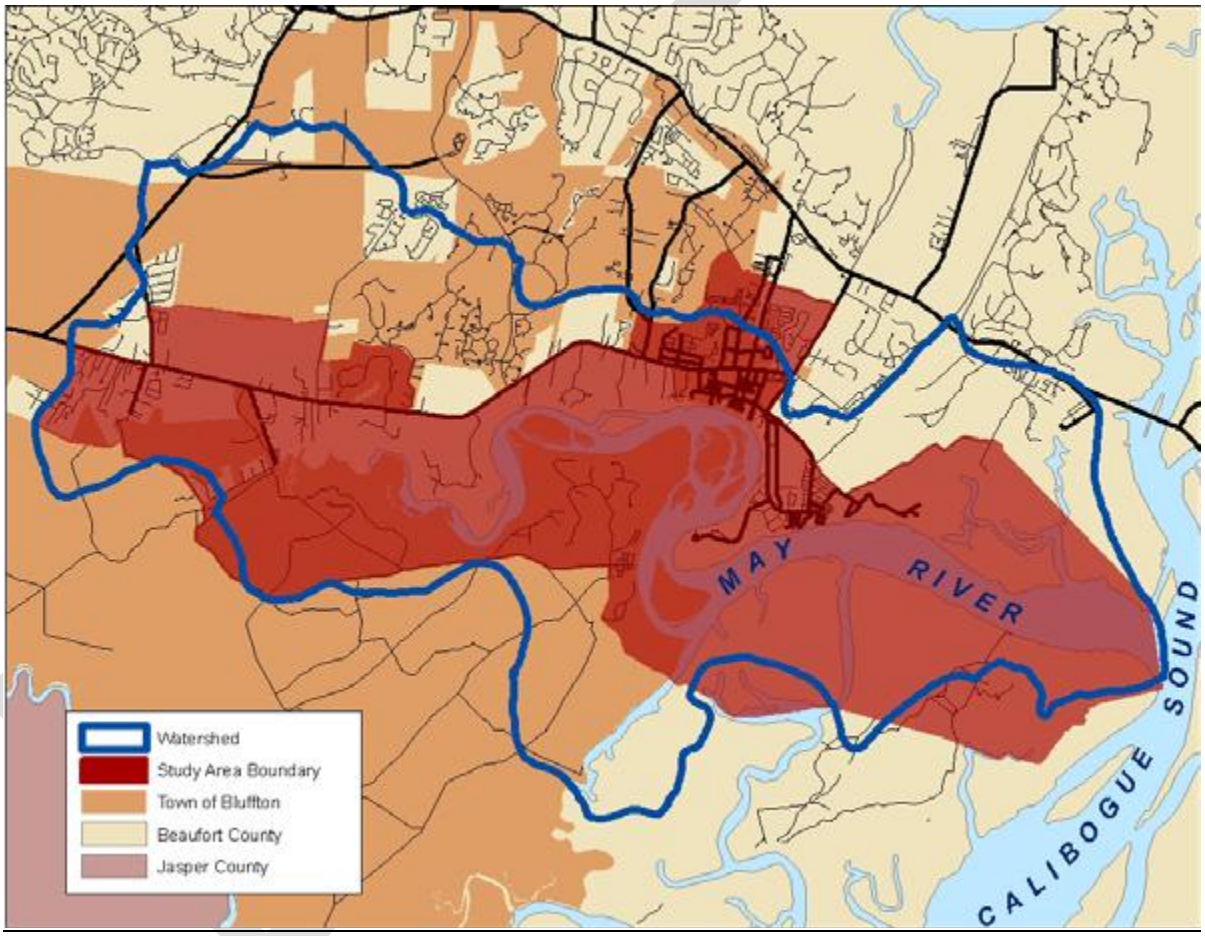
- Delineate May River Watershed
- Impervious Surface Map (Current and Projected)
- Watershed Analysis
- Sensitive Area Determination

3.1 Delineate May River Watershed

Introduction

To fully address the problem of rising fecal coliform levels within the May River Watershed, an understanding of the drainage network flowing to the May River must be achieved. Without this understanding, identifying problems, cause and effect relationships, and potential solutions is all but impossible. To apply thorough scientific process to identifying and implementing solutions to rising fecal coliform levels, an understanding of the drainage sub-basins and where the runoff from these sub-basins goes is necessary.

Delineating the May River Watershed into many smaller sub-basins and identifying flow paths from one sub-basins will form the beginning of a drainage and pollutant transport model that will allow various scenarios to be tested prior to implementation. This drainage / pollutant transport model will allow the effectiveness of each individual scenario on the entire watershed to be explored prior to implementation as well as identifying and predicting the unintended side effects of implementation on the sub-basin and watershed level.



Background

Historically, the flow network and how water flows throughout the May River Watershed has been poorly understood and even more poorly documented. Much of the knowledge of how water flows from one place to another was known only by individuals such as ditch maintenance crews that needed the information to properly do their

job. This information was typically not documented, but rather, known only to the persons performing the work. Even less understood and documented was the amount of area that drained to a particular ditch, pipe, or culvert.

As the May River Watershed became more developed, engineering requirements dictated that detailed hydraulic and hydrologic analysis of development sites be performed. This lead to a better understanding and documentation of the flow network and drainage areas

For the purpose of this section of the May River Watershed Action Plan, the following definitions shall apply:

Watershed or Basin: The entire area of land that currently drains to the May River. The May River Watershed is approximately XXXX acres, or XXX square miles and is shown below. The term watershed is synonymous with the term basin. The May River Watershed could be described as the May River Basin.

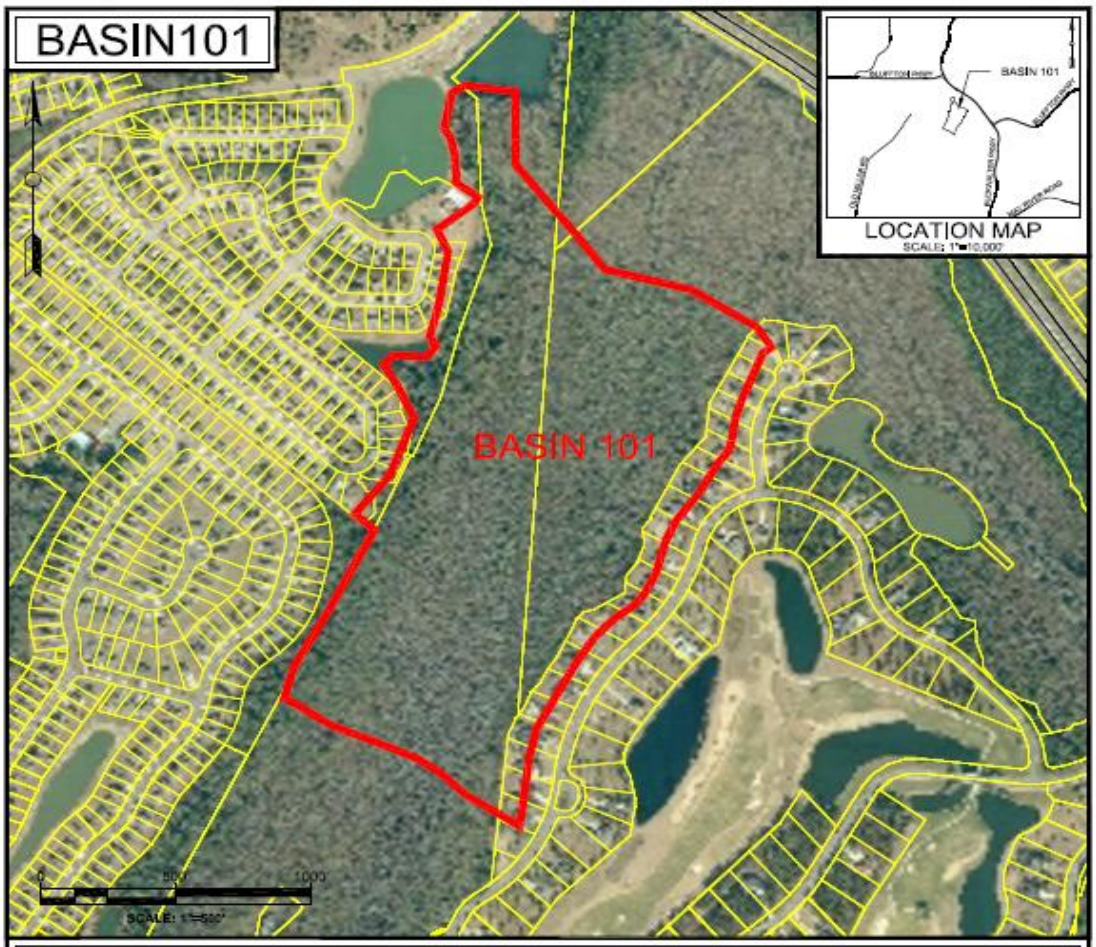
Sub-basin or Sub-watershed: An area smaller than a watershed that is defined based on political, topographical, and spatial factors. The watershed is defined by many smaller sub-basins. Each sub-basin could be further divided into a number of smaller sub-basins. Each sub-basin will have a flow path that flows to another sub-basin. Flow paths link each sub-basin to other sub-basins and define the route that rainfall and subsequent runoff will take on its way to the May River.

Delineation: The process of dividing a watershed, or basin, into smaller sub-basins. Sub-basins will be delineated on the basis of political, topographical, land use, and other factors.

Resolution

The May River Watershed will be delineated into approximately 400 sub-basins with an average size of approximately 70 acres each. Additionally, the flow paths and interconnectivity between each sub-basin will be defined. The sub-basins boundaries and flow paths will be

input into AutoCAD and subsequently converted into shape files for use in a Geographical Information System (GIS) system to produce the deliverable associated with this task of the May River Watershed Action Plan.



BASIN CHARACTERISTICS TABLE				
LAND USE DETAILS	SOIL NAME AND HYDROLOGIC GROUP	COVER DESCRIPTION	CN	AREA (AC.)
	CAPE FEAR LOAM, C/D	WOODS, GOOD CONDITION	75	40.10
	SEABROOK FINE SAND, A	WOODS/ GRASS, GOOD CONDITION	32	15.71
WETLAND %	72	TOTAL AREA (AC.)	55.81	
UPLAND %	28	WEIGHTED CN	63	
IMPERVIOUS %	0	APPROXIMATE TOC (MIN.)	15	

<u>Immediate Implementation Strategies</u>

The first phase of the project is to identify and catalog all existing development plans within the May River Watershed. Most development plans were required, depending on the time of submittal, to submit a drainage study and report as part of the development plan. These development plans would typically show pre-development and post-development drainage basins and flow paths. No electronic plans were available at the time of the study. Therefore, developments that showed post-development sub-basins and / or flow paths would be scanned so that the resulting image could be imported into AutoCAD. The images would then be scaled and aligned so that the sub-basins and flow paths could be digitized from the scanned image. This method was very successful at delineating and showing flow paths for a large portion of the May River Watershed. This is due to the large number of Planned Unit Developments (PUD's) that make up much of the development within the watershed. This method was not applicable to areas that were not part of a planned development such as the Old Town Historic District of Bluffton or areas along the May River and in the County that were developed many years ago. This method also was not applicable to undeveloped areas as development plans for these areas have not been submitted yet.

Although this method of delineation and determining flow paths was very efficient and economical, the method did have its limitations. The main limitation of this method was that often development plans did not reflect "as built" conditions. As with most construction and development, plans often change as new information is determined or other factors are taken into account. The development plans that we were able to locate were often the initial plans and did not show any revisions that may have occurred or the "as built" conditions. To remedy this problem, a site inspection or local knowledge of an area was required to validate the development plans. In some cases, the development plan that we had located was nothing like the development that had actually occurred. In cases such as these, another method was employed to determine flow paths or sub-basins.

Another limitation of this method was that many development plans had not been built at all or only a portion of the plan had been built.

Again, local knowledge or site inspection was able to reveal this information.

A possible remedy to this limitation would have been to use "as built" drawings instead of development plans. However, we found that "as built" drawings were not nearly as available as the development plans. This was most likely due to the fact that the requirement to submit "as built" drawings is typically not enforced to the same extent as the requirement to submit development plans. Another drawback of using "as built" drawings is that sub-basins would almost never be shown on the "as-builts". Flow paths were typically shown or easily determined from the "as built" drawings.

This method was very effective as each development plan area had typically had studied in much greater detail than was possible with our budget and schedule constraints. This method allowed us to quickly and effectively capture the knowledge and information from each individual study.

The second phase of the project is to use LiDAR to determine flow paths and sub-basin boundaries. Typically engineering firms use a combination of LiDAR, survey data, and field investigation to determine sub-basin areas and flow paths between sub-basins. Using elevation data from LiDAR and engineering experience and judgment, sub-basins and flow paths were created. This was used mostly in undeveloped areas and wetlands where development had not influenced drainage patterns.

There are also limitations with using LiDAR as a source of data. LiDAR depicts elevations of the ground or the top of water elevation in ditches, ponds, or streams. When water flows under a road, this information is not shown in LiDAR data. Engineering judgment and field investigation were needed to see if water flows through a pipe or culvert as this information is not obtainable from LiDAR data.

LiDAR is not very useful in heavily developed, piped areas. This is due to the fact that piped areas often direct and drain stormwater in ways that the natural topography would not. Extreme caution should be

used when using LiDAR to determine basins and flow paths using LiDAR in developed areas. Knowledge of inlet and pipe locations is required to use LiDAR in developed areas.

Another limitation of LiDAR concerns the methodology of obtaining the data to generate the LiDAR contours. The most common way is to take an elevation reading in a grid-like fashion using technology that will not be discussed here. However, the size of the grid can be a limitation and must be taken into account when analyzing and using LiDAR data. In our case, a data point was taken every 16 feet. Therefore, if a ditch only 4 feet in width runs through an area, the possibility exists that the ditch will not be shown in the LiDAR data. Statistical and analytical methods generally are able to minimize this possibility; however, it should be taken into account when using LiDAR data.

Another technical limitation of LiDAR data is that water in a ditch, pond, or stream will be shown as ground when the data is taken. The technology cannot differentiate between water or ground when an elevation is returned. Again, statistical and analytical methods generally minimize this error, but care must be taken when using LiDAR for this reason. The problem typically arises when a ditch is full of water when the data is obtained and thus a ditch is not shown to exist because the water is at the same level as the surrounding ground.

The final limitation of LiDAR is the date of which the LiDAR data was obtained. In our case, Beaufort County had obtained the data to generate LiDAR in 2006. Any modifications or land disturbance done after 2006 would not be reflected in the LiDAR data. Therefore, field investigation and local knowledge was required to determine if modifications to the landscape had been done after the data was obtained in 2006.

Generally, using LiDAR was very effective in areas that were known to be undisturbed or in areas such as wetlands that had a high likelihood of not being disturbed. The advantage of LiDAR is that large areas of undisturbed land can be quickly delineated and flow paths determined.

The final phase in the project is field investigation and local knowledge. This phase is paramount to the success of the project. "Ground truthing" the data and findings is the only way to validate the information determined in the previous two phases. The process generally involves taking a map generated from data from the previous 2 phases to the field and verifying that assumptions made in the previous two phases are valid. Additionally, areas where the previous two phases were unable to determine flow paths and / or sub-basins would be determined in this phase.

Depending on the level of accuracy required or level of uncertainty of assumptions in various areas, a topographic survey may be required. In our case, we did not feel that a survey was required due to the relative quality of information we had previously obtained and the level of comfort and knowledge we had with understanding the May River Watershed. The knowledge from Town Staff who had worked for years in the watershed was critical to the decision to not use survey. Additionally, this study will serve as the framework for the development of a detailed drainage / pollutant transport model, which will require some survey information, particularly on inverts of pipes, culverts, and ditches as well as determining the geometry of ditches.

The three phases described above were used to digitally create a flow network that defined sub-basins and the interconnectivity between each basin. It is important to note that this study did not focus on how sub-basins were physically interconnected (pipe, culvert, ditch, etc.), but rather focused on the direction of water flow from one sub-basin to another and defining the area of each sub-basin. Determining the flow paths and direction is important so that when an area of high fecal coliform concentrations is determined, the sources upstream can be quickly identified and investigated. The determination of flow path location and direction also will serve as the roadmap for identifying where detailed survey information needs to be determined to create the detailed drainage / pollutant transport model. Determining the areas of each sub-basin is important because the area of each sub-basin is required to generate and estimate runoff volume and duration in the drainage / pollutant transport model. Knowing the areas also

aids decisions on where the most effort should be spent on reducing fecal coliform sources.

The delineation and flow paths for the May River Watershed are shown in Appendix XXx.

Long Term Implementation Strategies

No long term implementation strategies are required as this deliverable will serve to build the foundation for the Stormwater Drainage / Pollutant Transport Model. All information determined in this deliverable will be transferred to the Stormwater Drainage / Pollutant Transport Model. It is this model that will be required to have long term implementation strategies. However, long term strategies to be implemented in the Stormwater Drainage and Pollutant Transport Model as they pertain to this deliverable are discussed below.

As new development occurs and drainage patterns are altered and better understood, information must be captured and incorporated into the stormwater drainage / pollutant transport model. The Unified Ordinance could be changed to require that digital files of the post-development drainage sub-basins and flow paths and directions be shown. Additionally, the physical characteristics of each sub-basin and flow path should be digitally transmitted. Information on the sub-basin should include geo-referenced location, sub-basin area, post-development impervious percentage, post-development SCS curve number, and post development time of concentration. Flow path information should include flow conveyance type (reinforced concrete pipe, corrugated metal pipe, ditch, etc.), flow conveyance Manning's n value, flow conveyance geometry, flow conveyance geo-referenced location, flow direction, inverts of upstream and downstream limits, and other pertain flow performance characteristics such as weir elevation, type, and length. All information should be required on an "as built" basis. As information is received, it should be used to update and supplement the Stormwater Drainage and Pollutant Transport Model, which, in turn, will further the understanding of the May River Watershed.

3.2 Impervious Surface Map (current and projected)

Introduction

The amount of impervious surface within a watershed directly affects the water quality within a watershed if not properly controlled. Previous studies have shown a direct link between water quality and impervious surface (CITATION). Specifically, an increase in impervious surface with uncontrolled stormwater will produce a negative effect on the water quality and health of a watershed.

Impervious surface – one of building blocks of drainage and water quality model

Impervious surface map serves as tool for planning, giving planners and elected officials the capacity to visually observe geo-political areas of impervious percentages and plan growth and economic development from a watershed standpoint

Impervious surface also will validate fees charged for stormwater utility fee – I think.

Background

Bluffton has grown from 1 square mile to about 53 square miles. Amount of impervious percentage has increased drastically. Land use been converted from pine plantation and wetland to suburbia.

Determining impervious percentage of town is difficult due to a number of factors, discussed later. To date, only general estimates have been completed and accuracy has been debated.

Goal of determination is to obtain accurate estimate while balancing cost considerations.

First determine current overall impervious percentage as of 2009. Then determine effective impervious percentage as of 2009. Effective

impervious is the amount of impervious area where the impervious area is not Then, determine

4. May River Watershed Indicators

An inventory of watershed indicators defined by sub-drainage basins and based on testing and sampling efforts both historic and future direct additional management efforts for the May River. Understanding this inventory will help to better calibrate targeted watershed retrofits and other improvements as well as provide a measure of success for improvements. Enabling the public access to data will promote education concerning the watershed and possibly generate previously unknown ideas on ways to better the May River Watershed. Once key parameters are determined and catalogued, a model can be developed to understand the roles the parameters play in the watershed. Ideally, this model could be used in concert with the hydraulic and hydrological model as discussed above.

For many years, technical staff has been researching the many parameters that are assessed as part of an evaluation of environmental health. This section consolidates that information and calibrates the findings toward targeted action items. Calibration of findings will allow for an identification and review of both physical and mental retrofit options. County study on water budget changes in partnership with SC DNR will add hydrology impacts in basin.

Deliverables

- Development of key water quality indicators
- Matrix, schedule and inventory of past applicable watershed studies
- Matrix, schedule, and inventory of ongoing watershed studies
- Matrix, schedule, and inventory of future watershed studies
- Existing Conditions Watershed Report

- Develop model to predict fecal coliform, stormwater volume, and/or other indicators to meet standards

4.1 Development of Key Water Quality Indicators

The previous designation for the May River was shellfish harvesting waters (SFH) which has specific numeric criteria for most units established in Regulation 61-68. The standards include prohibition of disposal of garbage, cinders, ashes, oils, sludge or refuse, strict limitation of treated wastes, toxic wastes, deleterious substances and colored or other wastes. The following numeric standards are stated in this section:

Dissolved Oxygen (DO): Daily average of not less than 5.0 milligrams per liter (mg/l) with a low of 4 mg/l.

Fecal Coliform: Not to exceed a Most Probable Number geometric mean of 14/100 mg/l; nor shall more than 10% of the samples exceed an MPN of 43/100 mg/l.

Enterococci: Not to exceed a geometric mean of 35/100 ml based on at least four samples collected from a given sampling site over a 30-day period; nor shall samples exceed a single maximum of 104/100 ml.

pH: Shall not vary more than 3/10 of a pH unit above or below that of effluent-free waters in the same geological area having a similar total salinity, alkalinity, and temperature, but not lower than 6.5 or above 8.5.

Temperature: Average temperature shall not exceed 4 degrees Fahrenheit above natural conditions during the fall, winter or spring, and shall not exceed 1.5 degrees

5. SCDHEC Section 319 Grant Implementation

The ongoing SCDHEC Section 319 Grant is a critical piece of the May River Watershed Action Plan. The Section 319 Grant is authorized for use in cases where clear implementation options exist with the stated goals of improving water quality on the May River. The many specific elements in this broad and far reaching grant add up to a greater whole, while providing targeted solutions that are implemented in the now- and the short-terms.

Deliverables

- Manure Management Plan
    a. Hobbyists
    b. Commercial
- RV/Campground Waste Management Plan
- Wildlife Management
- Bird Roosting Deterrent
- Construction Site Inspection Program
- Ditch Enhancement/Erosion Prevention
- EPA Water Sense Partnership
- Social Marketing Campaign
- Pet Waste Station Installation
- Pet Septic Systems
- Unified Ordinance Overhaul
    a. Stormwater Ordinance
    b. Land Use & Limits on Land Disturbance
    c. Septic System Maintenance Ordinance
    d. Pet License Ordinance
    e. Unified Ordinance for Watershed-based Planning
- Septic System Inspections/Pump-outs
- Septic System Replacements
- Pond Enhancements
- Enhanced Buffers
- Pilot Project
- Old Town Rain Barrel/Rain Garden Retrofit Project

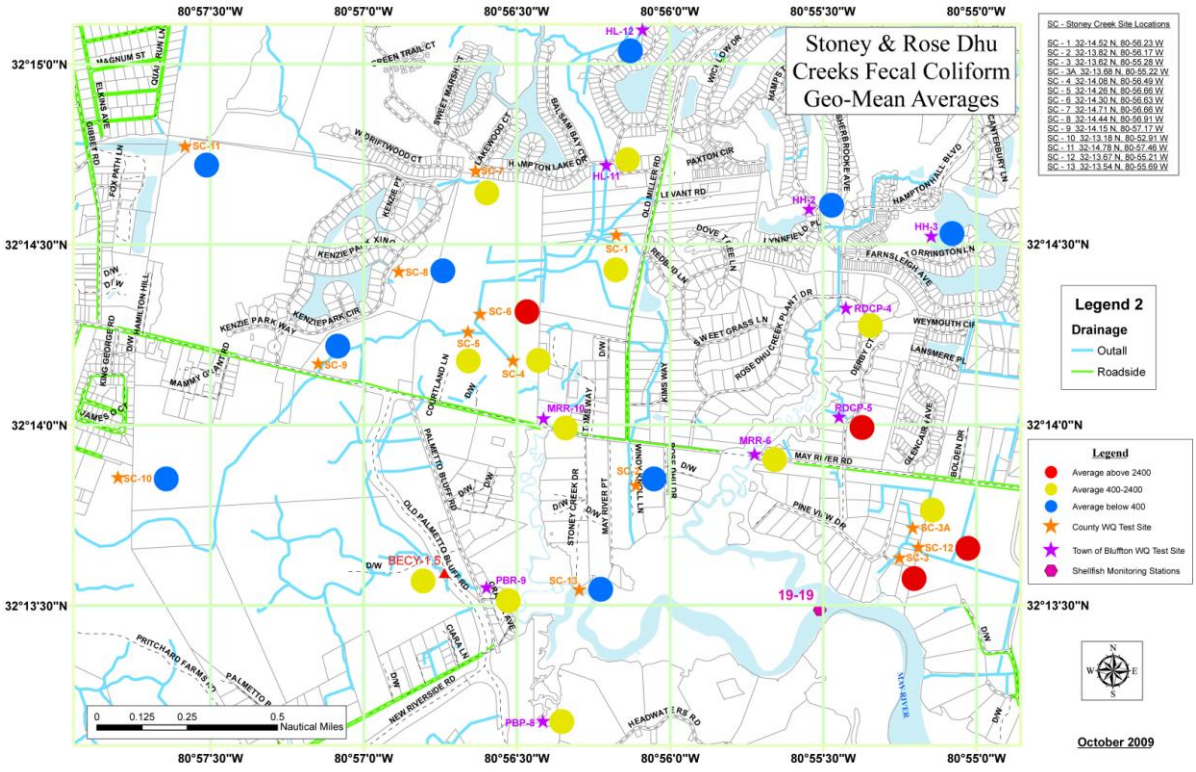
6. Hotspot Identification and Targeted Retrofits

Existing and identifying additional Hotspots and opportunities for targeted retrofits provides the opportunity for the "low-hanging fruit" to be identified and selected for repair, restoration, or reconditioning from the perspective of the watershed. It also serves as a basis and framework for more ambitious projects that may be more complex and less understood. Lessons learned here will be very beneficial to future endeavors.

Deliverables

- Hot Spot Identification Map
- Hot Spot Identification Matrix
- Map of Targeted Immediate Retrofit Options
- Map of Future Retrofit Targeted Opportunities
- Targeted Retrofit Implementation Schedule including Immediate and Future Opportunities

6.1 Hot Spot Identification Map



6.2 Hot Spot Identification Matrix

6.3 Map of Targeted Immediate Retrofit Options

6.4 Map of Future Retrofit Targeted Opportunities

6.5 Targeted Retrofit Implementation Schedule including Immediate and Future Opportunities

- Gasciogne Bluff
- Pilot Project
- Old Palmetto Bluff
- Oscar Fraser Park

7. Public Retrofit Opportunities

There are many public retrofit opportunities throughout the May River Watershed. This section identifies them and applies a scope toward their implementation. Many of the projects and deliverables in this section will aide in meeting the MS4 requirements for Beaufort County and the Town of Bluffton. It is important that retrofit opportunities are implemented in a way that provides incentives to stakeholders who will be primarily affected.

Deliverables

- Identification of Public Projects for Retrofit
  - Gasciogne Bluff
  - Pilot Project
  - Old Palmetto Bluff Road
  - Oscar Fraser Park
- Prioritizing of Public Projects in need of Retrofit
- Recommended Zoning and Development Standards Ordinance Amendments

8. Public/Private Opportunities

New development must meet new requirements with private efforts and existing communities will generally be retrofitted with public funds. There may be opportunities in the approved but not built communities to have jointly funded retrofits, Part of encouraging this will be establishing controls for individual homes that will make regional and community based solutions viable.

Deliverables

- Identification of individual home BMPs in approved developments
- Targeted communities for volume sensitive controls

9. Private Retrofit Opportunities

There are many private retrofit opportunities throughout the May River Watershed. This section identifies them and applies a scope toward their implementation as well as discusses incentives to encourage retrofits.

Deliverables

- Identification of Projects for Retrofit
- Prioritizing of Projects in need of Retrofit
- Recommended Development Agreement Modifications
- Recommended Property Owner Association Covenants, Codes, and Restrictions Modifications
- Development of incentives to encourage retrofits in priority areas

10. Communication and Marketing

The May River Watershed Action Plan will only be successful if the public understands and supports it. As such it is important to communicate and market the goals of the May River Watershed Action Plan. Creating a plan to market the goals and creating a May River Brand that is easily recognizable is instrumental in the success of the project.

Additionally, the social marketing campaign related to this solicitation will be aimed at improving water quality in a local waterbody, the May River. The purpose of this RFP is to outline the expectations the Town has of such a campaign to meet the following objectives:

- Increase awareness among residents that their behaviors and activities impact water quality;
- Develop key messages promoting positive, behavioral change as part of a community-based social marketing campaign that targets select segments of the local population based on demographic or other characteristics;
- Develop social marketing materials that will effectively and efficiently deliver the key messages;
- Create a campaign brand that is identifiable and compatible with other Town initiatives.

Deliverables

- Communications / Marketing Plan Development
- Communications / Marketing Plan Implementation

11. Timeline

A timeline is provided so that the now-, short-, and long-term solutions have some measure of success, while allowing for the local, regional, county, state and Federal government to assess and assign priorities.

This document is designed to be a living document, or a document that is ever changing as new information is learned and a better understanding of the May River is reached. Therefore, the timeline associated with implementation of this plan should be constantly evolving as new and better information becomes available.

Deliverables

- Implementation Schedule

11.1 Implementation Schedule

Introduction

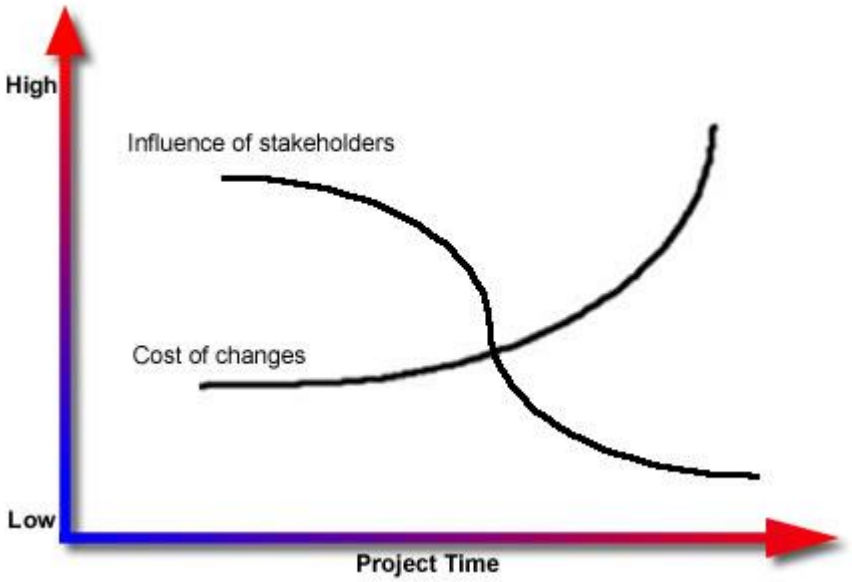
For the purpose of this document, the now-term is defined as a period of less than 1 year from plan implementation. Short-term is defined as a period of 1 – 3 years from plan implementation. Long-term is defined as a period of greater than 3 years from plan implementation. It is expected that this plan will take 5 years to implement.

Background

In determining what deliverables should be considered now-term, short-term, or long-term, the purpose of each deliverables should be considered.

Now-term – easily obtained information collection and quickly implemented, high likelihood of success solutions. More difficult to determine information collection should be based

on answering a specific question concerning the health of the May River and / or serve to guide future decisions and policy toward implementation of this plan. Timeframe priorities are also based on the fact that the cost of changes is lowest and the influence of stakeholders the highest at the beginning of a project, while the cost is highest and influence of stakeholders is lowest at the end of the project.



Immediate Implementation Strategy

Recognizing and understanding the factors that influence the priority of a particular deliverable within this plan, the timeframe of deliverables is as follows:

Section Number	Project	Timeframe
3.1	Delineate May River Watershed	Now-term
3.2	Create Impervious Surface Map	Now-term
4.1	Development of Key Water Quality Indicators	Now-term
5.1	Final SCDHEC 319 Grant Report	Now-term
5.1	Social Marketing Campaign	Now-term
5.13	Unified Ordinance Overhaul	Now-term
5.16	Old Town Retrofits	Now-term
5.2	Pilot Project	Now-term
5.4	RV / Campground Waste Management Plan	Now-term

5.7	Construction Site Inspection Program	Now-term
5.8	Ditch Enhancement / Erosion Prevention	Now-term
5.9	EPA Water Sense Partnership	Now-term
11.1	Implementation Schedule	Now-term
12.2	Matrix of Responsible Parties	Now-term
13.1	Expecting Funding Requirements (Budget) with Scope Summary	Now-term
13.2	Matrix of Funding Mechanisms	Now-term
13.3	Matrix of Funding Opportunities	Now-term
2.1	Collection of Existing Plans	Short-term
2.2	Analysis of Existing Plans	Short-term
2.3	Recommendation Report	Short-term
3.3	Watershed Analysis	Short-term
3.4	Sensitive Areas Determination	Short-term
4.2	Matrix, schedule, and inventory of past water quality studies	Short-term
4.5	Existing Watershed Condition Summary Report	Short-term
5.11	Pet Waste Stations	Short-term
5.12	Pet Septic Systems	Short-term
6.1	Hot Spot Identification Map	Short-term
6.2	Hot Spot Identification Matrix	Short-term
7.1	Identification of Public Projects for Retrofit	Short-term
7.3	Recommended Zoning and Development Standards Ordinance Amendments	Short-term
4.3	Matrix, schedule, and inventory of ongoing water quality studies	Short-term
5.14	Septic System Inspections / Pump Outs	Short-term
5.15	Septic System Up-Grades / Replacements	Short-term
5.17	Enhanced Buffers Plan (Sea Grant)	Short-term
5.3	Manure Management Plan	Short-term
5.5	Wildlife Management Plan	Short-term
6.3	Map of Targeted Immediate Retrofit Opportunities	Short-term
7.2	Prioritizing of Public Projects in need of Retrofit	Short-term
8.1	Identification of individual home BMPs in approved developments	Short-term
8.2	Targeted communities for volume sensitive controls	Short-term
9.1	Identification of Public Projects in Need of Retrofit	Short-term
9.2	Prioritizing of Private Projects in need of Retrofit	Short-term
9.3	Recommended Development Agreement Modifications	Short-term
9.4	Recommended Property Owner Association Covenants, Codes, and Restrictions Modifications	Short-term

4.4	Matrix, schedule, and inventory of future water quality studies	Long-term
4.6	Develop Model to Predict Fecal Coliform, stormwater volume, and other indicators	Long-term
5.6	Bird Roosting Deterrent	Long-term
6.4	Map of Targeted Future Retrofit Opportunities	Long-term
6.5	Targeted Retrofit Implementation Schedule	Long-term
9.5	Development of incentives to encourage retrofits in priority areas	Long-term
10.1	Communications / Marketing Plan	Long-term
10.2	Implement Communications / Marketing Plan	Long-term

Long Term Implementation Strategies

It is recognized that the May River Watershed Action Plan is a dynamic and ever-evolving document that will be updated and refined as new and better information becomes available. Therefore, it is understood that the timeframe associated with a deliverable may change based upon new information or a change of scope within a deliverable. These changes are healthy and necessary for a successful plan and will reflect our greater understanding of the complex and unique ecosystem of the May River.

12. Administration

The May River Watershed Action Plan will only be successful when the management entities understand limits, expectations, duties and responsibilities. This section of the Action Plan lays out roles and establishes a commitment schedule for implementation.

Deliverables

- Matrix of Responsible Parties to include
  - Town of Bluffton
  - Beaufort County
  - BJWSA
  - SCDOT and other public agencies
  - Private Entities
  - Stakeholders

13. Funding Mechanisms

A project of this scale requires a focus on a wide and far-reaching variety of funding mechanisms. It is not probable that a single funding source (such as Section 319) will provide adequate support for implementing the full Watershed Action Plan. However, understanding the broad range of funding options in the context of the bigger watershed picture will let decision makers capitalize on a framework for implementation that evaluates all resources.

Deliverables

- Expected Funding Requirements (Budget) with Scope Summary
- Matrix of Funding Mechanisms
- Matrix of Funding Opportunities